

## **Paul Rogers' Remembrance Sunday Lecture in the Imperial War Museum, 8<sup>th</sup> November 2015**

It's a real privilege to be here. I am from London originally, from East London and I remember visiting this museum as a boy. It's many years since I was last here and I've had an hour or so to go around and it's very interesting in so many ways, but it gives you one side. It does give you some of the other side of the story, but it mostly gives you one side of the story, and it is obviously concerned primarily with wars in the past. I want to look a little bit more to the future, but I hope you'll indulge me a little bit if I talk about semi-personal experiences of past wars.

I moved up to Yorkshire as a socio-economic migrant when I got married 45 years ago. My wife's father had got married quite late and he was already 80 years old when we got married, and he lived with us for the last 10 years of his life, not entirely in failing health. He'd had a remarkable life. He was born in 1890 and in the very early part of this century he was apprenticed first as a carriage maker and then he worked as a horseman.

Now 'horseman' was one up the scale from a groom and he worked at some of the big houses in West Yorkshire in the Huddersfield area. Naturally enough when he joined the army at the start of the First World War he was taken into the Royal Artillery because he knew about horses, and at the time of the start of the war almost all the long range artillery guns were horse-drawn. He survived three and a half years along the western front and he only came back twice, both times severely injured on a stretcher. He would never talk about it. In fact right at the end when he was approaching ninety I would occasionally have small conversations with him, but it was clear that the horror was still with him and the fact that he showed such resilience in spite of extraordinary scars is something that I will always remember.

If we go to the Second World War, as I say I'm a Londoner, I'm from East London. I went to school in Walthamstow. My own father at the start of the war volunteered to join the RAF, he actually wanted to be in Bomber Command. I suppose fortunately for me and the rest of the family his eyesight was too poor and he was eventually put into the London Fire Brigade, which as it happened was probably the second most dangerous occupation because so many firefighters got killed during the war.

He survived and towards the end of the war he was actually involved with officer education. One of his other posts though was to join the crew who were doing the 24-hour organization of civil defence right across London, they were down in a bunker underneath or just next to the Geological Museum. He happened to be on duty the night of the 12th / 13th of June 1944 and at about 4:30 in the morning the first of the V-1 flying bombs hit a bridge in Grove Road just in South Chingford and killed six people and did a great deal of damage. He was not very senior in the fire service and the people at his level had no knowledge of this new weapon, this vengeance weapon, and it was just put down as "powerless aircraft" and of course that became, for something like a year afterwards, one of the biggest threats to London along with the ballistic B1s and B2s. The V1 was essentially a very crude but very potent unguided cruise missile, in a sense the direct descendants have been used by the Americans and the British and of course recently the Russians in the Middle East; there is if you like a continuum.

So in a way in both examples from the First and Second World War are very powerful lessons which relate to many of the exhibits in this museum. My father-in-law's experience in the First World War and his deep reluctance to talk about it, my father's experience in the Second World War leading us right on in technological terms even to the present day.

Let me start with two points and they're sort of at opposite ends, and bear with me on this first one , it may strike you as slightly odd. When I first went up to live in Yorkshire I remember on an earlier occasion I had to drive over to York. Nowadays there's a route from Huddersfield through to York by the extension of the M1 but it wasn't there then. I used to go through Wakefield via the A642 to Tadcaster and then join the main road to York. You could go by a small by-road, which I took one day, not having taken it before, and having time to spare, that went through open rolling countryside, mostly arable but quite chalky, quite flinty in parts.

At one point going along the road there was a little cross, about six feet high by the side of the road just next to a holly bush, a 10 or 15-yard holly bush. I didn't know what it was and stopped the car to have a look. There was no indication. All it had on it, and this would have been April of that year, was a date, 1461, and underneath a little wreath laid recently. So I couldn't understand this. It was on the way to the village of Saxton, just near the village of Towton, so I looked at the details when I got home. If you take that route now it has a small lay-by with some very good descriptions of the battle that took place there.

The battle of Towton, fought on Palm Sunday 1461, is the climactic but not the final battle in the Wars of the Roses between the Yorkists and the Lancastrians. It was appalling. The Yorkists won mainly because when they started, early on Palm Sunday in a snowstorm, the wind was behind them and their arrows carried further. At the end of the day 28,000 people were dead and that was out of a population in England of barely three million, in one day. It's broadly equivalent to the entire losses throughout the First World War for the United Kingdom as a whole, in one single day. And that's Towton 600 or so years ago.

I say that because one always has to get a sense of perspective, if you're looking forward to the future, because when you're trying to tease out what the causes of wars might be, it can get extremely depressing. What one also has to remember is that in times past, carnage on many occasions with smaller populations has been even worse. There are people who argue, like the Harvard social psychologist Steven Pinker, that in fact we're slowly getting more peaceful, and his book "The Better Angels of Our Nature" is worth anybody's read. You may not agree with it entirely but it presents a different dynamic, a different way of looking at violence. So I always remember Towton. It stuck with me. In fact quite often if I'm going to that part of the world I go past it and just remember it, because it does give you a sense of perspective.

The other thing I wanted to mention was just one single quote which is looking much more to the future, and this is a quote from a conference which was run over 40 years ago in one of the northern polytechnics. It was run by a group of staff who were trying to bring together (this is the early 1970's) the issues of Development, Environment and Security in a single conference. They were very lucky to have a quite extraordinary speaker by the name of Edwin Brooks. Edwin, who developed a career later in Australia, is not well known in Britain. He had been a Labour Member of Parliament, he had been a chair of the Conservation Society and he was a lecturer in Economic Geography at Liverpool University when he came to speak, and he talked about the risk of the kinds of problems we would have within 40 or 50 years if we didn't alter our attitude to the broad concept of security.

And one particular phrase he used to say, stayed with me all through the years and I've used it quite a lot myself, quoting from him. He said the dystopia that we have to avoid is *"a crowded glowering planet of massive inequalities of wealth, buttressed by stark force, yet endlessly*

*threatened by desperate people in the global ghettos.*" That was 1972, the book was published in 1973 or 74, and here we are 40+ years later moving steadily into that world. I remembered what he was saying when I was looking at the television cameras of the soldiers and the barbed wire going up to keep the refugees out of Europe just a few months ago.

So what I want to do is to talk for no more than half an hour about what the future problems might be on the time scale of the next 30 years and not the immediate future. There will be a resonance with what's happening in the Middle East but I want to look much longer term, so it is necessarily speculative and I admit that. You may have lots of disagreements with the things that I try to pick out, which I think are the really significant trends, nevertheless I think it is worth giving it a go.

If we look to the future over the next 30 years what I'd like to suggest is the three overall drivers worldwide, things which are happening, trends which are likely to dictate the kinds of security issues we may have, the chances of peace and the risks of war.

**The first of these is very bluntly, worldwide, the widening socio-economic gap, the widening wealth-poverty gap.** It's not easy to recognise in a country like Britain for most people, even though about a quarter of our own population has got relatively poorer, particularly over the last 10 years. It is not easy to place it even worldwide because there have been huge developments in many parts of the world. You probably have 100+ million people in China who will be rated in wealth terms equivalent to say the European middle-class, maybe 50 to 80 million people in India similarly, maybe 20 million in Brazil, and maybe a million, a million and a half in a country like Kenya or Uganda. There has been a huge development, a huge range of economic growth but it has been incredibly divisive. It's not been accompanied by higher standards of socio-economic justice, equity or emancipation.

Essentially that is a trend which has developed particularly since the end of the 1970s during the period of the transition to what we call neoliberal economic policies, the Washington Consensus on development in the Global South, and the whole panoply of things which developed in the late 1970s. It's interesting to note that if you look at world economic growth as conceived conventionally, it was actually higher in the 40 years before 1970 compared with the 40 years after it. People tend not to appreciate that, and that's in spite of all the problems in the second world war. The problem is that the kind of system that we now have, to put it

bluntly, isn't fit for purpose because it is not delivering the fairness that it should deliver. You're seeing this expressed in many different parts of the world in many different ways but it's a fundamental issue and all the trends indicate that it is not changing. You can use all the different measures, I think there was a quote from Oxfam recently that the 60 or 70 wealthiest families in the world are wealthier than a whole cluster of states, that the wealthiest 1% is equivalent in wealth to about 50% of the poorest worldwide. More particularly the richest 20%, which probably frankly includes the great majority of us in this room, have 85% of the world household income. That is a trend which is still developing and it's leading to more and more resentment.

Part of the reason for that, paradoxically, is one of the real great successes of international development over the last 40 years, and that is huge improvements in education. Very early in my career before I moved over to the area I'm now working in, I worked for a couple of years in Uganda on a regional agricultural program, and I had some friends who were local teachers. I learnt a fair bit about what the Ugandans were trying to do. They were trying to get as many of their kids through 4 years of primary education as they could, so that at least people will be literate and the rest, and they were not too bad in terms of the gender gap as well, it could have been better but it wasn't too bad. At that time the entire country had one University, a college, Makerere, which had maybe 2 or 3000 students in a country even at that time of about 15 million people.

If you go back to that part of the world now you see that Uganda has succeeded in getting just about everybody through primary education, most through high school, and I think there is something like 7 or 8 universities across the country. It's been a transformation and that is repeated right across the global south. There are some areas where the gender gap is too still too perniciously wide, but even that is slowly changing.

The point about this is, with huge improvements in literacy, communication, and even the spread of the Internet, people are much more aware of the nature of the world they live in in the broadest sense, both in the country and transnationally. In other words people are much more aware of their own marginalisation and we're talking about *the majority margins*. It is an odd concept, you assume margins to be a minority, we talk about the majority in terms of a fair share of the development of the world as a whole.

Some of you, of the older ones among us, will remember a phrase which was very popular 30 or so years ago among the sociologists, and that was the so-called “*revolution of rising expectations*” in Britain; the idea that things were getting steadily better and wherever you were on the social ladder your life was improving. Now you have the much more common problem of the “*revolution of unfulfilled expectations*” or even *frustrated expectations*, and you're seeing that in many different parts of the world and in not a few places it turns out into really very considerable violence. You look at the almost unreported neo-Maoist Naxalite rebellion which has plagued large parts of India the last thirty/forty years, and that is being repeated in many countries. So you have a situation in which you have the world economy not delivering what it should deliver and we're already seeing the kind of thing that Edwin Brooks was talking about.

**The second trend links in very much, in fact in some ways it's representative of the banner at the front, [which reads “War Causes Climate Change, Climate Change Causes War”] and that is we are for the first time in human history finally facing up to the environmental limitations dictated by the entire planetary system,** the biosphere or the global ecosystem , call it what you will. We've had major problems of pollution and dereliction of the rest at national and regional levels, but it is only really in the last half century and in many ways in the last thirty years that we've begun to realize this is now a global phenomenon.

We did get a very clear early warning of it back about 30, 32 or 33 years ago when it was found that the ozone layer which protects us from excess ultraviolet B radiation from the sun was starting to be decayed by a cluster of chemicals, the chlorofluorocarbons which were believed to be entirely without effect , used like the gas in the packaging of Big Macs and the rest, used in refrigeration, used in aerosols, used to propel fire extinguishers, and the CFCs it turned out were degrading the ozone layer up in the upper atmosphere and the O<sub>3</sub> molecules were going into O<sub>2</sub> and the end result was that you were starting to get increases in ultraviolet radiation.

Fortunately in a way it was asymmetric in that for various complex reasons it affected the South polar region greatest every Spring, and that was picked up by a team led by Joe Farman of the British Antarctic Survey in 1983 and they realised that in fact the ozone layer almost disappeared for a couple of months. In other words, if there had been life around the

South Pole it would have been extremely difficult for it to survive. That message got through very quickly. It keyed in with other things that people were already learning, and extraordinarily the Montreal Convention which started the long process of phasing out the CFCs took place only four years later.

There are times when you have real issues obviously facing you when even governments and inter- government groups will act quickly. There is a sting in the tail though. It's going to take many years before the ozone layer completely repairs itself, there are still CFCs being liberated from old refrigerators on dumps across the world. It's still a problem but is it diminishing, it was recognized. The key thing about it was, this was the first occasion when we as a species were having an entire global impact, one single impact.

Which brings us on obviously to the huge one: that of course is what some people are now calling crudely carbon pollution, in other words the rise of global temperatures, the changes in the climate, climate disruption, following the production, the burning of very large numbers, gigatons even, of fossil fuels. Now this again is a worldwide phenomenon. It is partially recognised, in fact almost more so by the day, with the Paris conference coming in three weeks' time, that it is a far more difficult problem to deal with than the CFCs and the ozone depletion because it affects the whole way that we live and work industrially, and there have to be absolutely radical changes on that. But just remember what we know now about what will happen if we do not get to grips with it, and that is going to be really hugely traumatic.

There are two things about climate change which we now understand rather more fully than we did. The one is that it is quite deeply asymmetric . Many years ago it was thought that it would mainly just affect the northern and southern tropics because natural climate change over millions of years tended to have that kind of effect when it occurred through natural factors. People used to think in the 1990s, well it's going to be difficult but at least the richer, more structured countries will be there to cope. That now is not the case and we now know that there are two particular regions which are going to be more affected than any others, one is the Arctic which is warming far faster than the rest of the world, and that will certainly lead to sea level rises, particularly if we start to see the erosion of the Greenland ice cap; but the other actually is the tropics and subtropics particularly north of the Equator.

There is a huge belt all the way around the world north of the Equator through to basically the latitude of say central Spain which is going to be particularly affected, heating up more and drying out more. That would also affect the southern latitudes to an extent as well. The effect on the Amazonian rainforest could be astonishing. If it is thought that the world-wide temperature was to go up by three degrees ( it's gone up by 1 degree, almost, so far) the reckoning is that Amazonia will go up by about nine degrees. That would mean that you would essentially see the Amazonian rainforest which is one of the biggest carbon sinks of all, (storing carbon), lost, because bit by bit it would burn, almost to the level of the wildfires we are getting in Indonesia as I speak.

So it's this asymmetry that is so difficult but the other factor is that it is, as far as one could tell, slowly but surely accelerating, in fact what we have seen really this year is an indication of that because, as many of you will be aware, over the last twenty years or so you have had an increase in temperature average which seemed to slightly pause a little bit over the last five to eight years. That's been welcomed by deniers, saying that climate change isn't happening, but it's long been recognized that there are natural ups and downs in world temperatures, it goes up a bit then down a bit, and one of the main factors is the so-called Southern Oscillation: we know it more commonly as one of its key components, which is the El Nino / La Nino effect . Those were more or less out of synch until the last year and now they seem to be in synch which is why this year is well-nigh certain to be the hottest year worldwide on average ever recorded. And we are likely to see quite major increases in temperature between now and 2020.

So we have these factors but the key thing to all of this is that what it does as climate change takes root, is that it undermines the ecological carrying capacity of huge areas of croplands to produce food at the level they do at present, and this is at a time when the population is still growing worldwide, and essentially that will be the downside if we do not get climate change under control and essentially that would mean all kinds of issues which I'll come onto very shortly.

**Then we come to the third factor and this if you like is the way that security is seen.** Essentially you will call it the paradigm of the control paradigm. When push comes to shove, the more powerful , more well off, more comfortable parts of the world will, if they see themselves threatened , use force to prevent that threat . And it's certainly fair to say that, you know, any major military group around say

in the Western world particularly, the major think tanks, are looking to what are going to be the future threats and how to handle them.

Let me tell an anecdote on this one. About three years ago I had an email, more or less out of the blue, from a colleague who works at the "Changing Character of War" programme which is based at Pembroke College in Oxford University, who said they were running a seminar, it's part of a series they run about once a year for a particular small foundation. They were running a seminar on the security, complexities and consequences of weak and failing states. How would future problems of weak and failing states affect British security? and they had a series of experts on different parts of the world which might be prone to this sort of problem but they wanted somebody just to give a bit of an overview at the start before getting the really knowledgeable people in. Would I be prepared to do the overview? - because I sort of do work a little bit on broad brush issues. It was a one day conference and it seemed quite interesting. It was down at Wadham College The guy was not really quite forthcoming about who the participants would be, so I assumed they'd probably be diplomats from the Foreign Office or some such.

So I went down and took part in it. It turned out that the participants were the commandant and all the senior officers of the SAS, joined by people from MI6, and the defence and intelligence staff of the Foreign Office; this is one of a series of seminars, held more or less annually, funded not by the taxpayer by a private foundation, which actually enables the elite military forces to look ahead at the kinds of issues that they are going to face; and in many ways I've met that - I'm lecturing in a couple of weeks at the Royal College of Defence studies - I've met that when I have been talking to military think-tanks. These are serious professional people who are looking ahead long term as to what they have to do. In fact if you read the reports coming from outfits such as the "Development Concepts and Doctrine Centre" down in Shrivenham they will give the same kind of analysis that we are going through this afternoon: marginalisation, refugee flows, migration, climate change - they add other things as well, the possible rise of China or the re-rise of Russia - but they tend to focus long-term on these issues.

The thing is that from their perspective quite naturally what they're about is keeping their own country or their own alliance secure, so what they're looking at is how to maintain the situation as it is at a time when you may get all sorts of problems developing.

What it is not doing is going beyond that to look at the underlying reasons why we're getting these problems, and that is the real difficulty that one has. I mean if we're looking at what the risks would be, and this is just the worst case because there are really good alternatives to this, but if you look at what the risk would be then essentially, if climate change continues to develop as it is developing now and moves into pretty wholesale climate disruption, the richest countries will more or less be able to cope, at least for two or three decades. If it gets completely out of control then nobody will be really in a very good position to do very much, but the richer countries would be able to do it. But those countries experiencing the biggest changes, also the poorest countries by and large, will have huge difficulty.

You would move into an era of very considerable anger and resistance and resentment not just against their own states but other states that are part and parcel of a system which is seen as deeply unfair. There would be huge pressures of movements of population. One major study done by a migration research centre reckons that if climate change was to really develop along predicted paths, within 20 years the numbers of people wanting to move would not be the 20 to 30 million we have now, but more like 400 million, and people would be desperate to move, but such movement would be constrained. Those are the conditions in which you get much more violent movements. So that is the kind of issue that we're going to face. And for my mind we're into an era, not so much of a clash of civilizations against radical Islam, but a kind of age of insurgencies, revolts from the margins, and this is what is recognized in military circles as being the kinds of problems we're going to face in the future. Of course I'm saying, "we, we, we're" all the time. What I mean is us in the richer communities, either here or in other parts of the world.

If you go back to what Brooks was saying, "the crowded glowering planet of massive inequality of wealth, buttressed by stark force", the phenomenon of the protected city, of the protected compound, the secure compound is far more common now than it was fifty years ago right across the Global South, and to an extent in countries like Britain as well. I remember going through a very well-off, to put it nicely, housing estate out in the Home Counties not so long ago, and as you drive along a road which is actually a public road there is a little indicator board which just throws up your number plate. In other words as you enter this estate, on a public road, your number is recorded and they put it on the thing so that you know that they know your car's going through, and that is the kind of phenomenon on a very small scale we are seeing more and more

worldwide. And in a sense, we have the Strategic Defence and Security Review due to be published quite soon, and I would hope that it would recognize that we have this same sort of problem and that it cannot be controlled by military means. I very much doubt it .

So let me finish by looking at the other side because the title of this talk, very ambitiously I'm afraid, far too ambitiously, was "future wars and how to prevent them". I suppose in short it's easy: what you have to do is move to a much more equitable global economic system and one which is progressively, within 20 years, ultra low carbon. Now it's very easy to say that in a single sentence but it is a massive requirement. So let's finish off by looking at some of the positive signs because an awful lot is happening.

The first one, which I think is particularly fitting for London, is to remember that if knowledge is available and people are thinking through the alternatives, when events happen which make it absolutely clear that a choice has to be made, you can get very quick action. I will betray my age by saying that as a boy, age nine, I was in London in the winter living in London, going to school in Walthamstow, in the winter of 1952, and that was the winter of the Great Smog of London. That lasted for four days in a combination of a severe thermal inversion layer over a city rich in coal fires and industries where the smoke could not get out and formed smog and it was terrible. I mean certainly in this lecture theatre now if that had been in the open I would only have been able to see the first four rows, that's all . And that lasted the best part of four days, some of you I'm sure will remember it. In that period at least 10,000 people died. At the time it was thought to be 4 thousand, epidemiologists later said was far more. People who were mostly elderly, bronchitic, asthmatic and the rest, died and they died in their thousands.

It affected, though, the media, the print media and the radio mostly that time, and the politicians who were in session. what it did was to speed up hugely the introduction of Clean Air Acts right across Britain , probably brought them forward about five years or so because people were already arguing that something had to be done and this was proof that it had to be done.

Those of us from London who know history will know if you go back through deeper history to the famous Great Stink of London in 1858, that was when the complete lack of any kind of major sewage system meant that the whole of the Thames and the subsidiary rivers had become one

gigantic sewer, so much so that it was far too smelly to even go near the Thames, and even parliament in its wisdom decided to sit somewhere else; but it was so bad that the people had already been saying “this growing city has to have a proper sewage system” so Joseph Bazalgette and the Metropolitan Water Board and the rest got their way.

Joseph Bazalgette and his team built the Northern and Southern outfall sewers, to be absolutely frank what they did is they took all the crud down river and put it down in the lower reaches of the tidal Thames. But to be fair to them in succeeding years they had some of the world's biggest sewage farms like Beckton built and more or less intermediately sorted out the system and incidentally did very much to see the final days of cholera in London. That was one event which actually in a sense catalysed what was known to be necessary action.

In some ways much more recently Joe Farman and his team finding about the ozone depletion problem spurred very quick action. There's a very interesting little story about that because when Farman and the group reported to the British Antarctic Survey what they'd actually found out, this was then checked with NASA in the United States which did actually have satellites up which could have picked up this anomaly but apparently hadn't been doing so. Well so this anomaly we knew was happening because of actual ground measurements but the satellites, admittedly in the 1980s perhaps not quite as advanced as they are now, were not actually picking it up, and it turned out that there was a programming element in the satellite that if a satellite suddenly recorded an absence of ozone, that was categorised as an instrument failure and was regarded as something which couldn't be happening. When they reassessed their data it confirmed what the BAS team was saying, which is one of the reasons very quickly why you have the Montreal Convention formed. Yet another example of what can happen!

So I suppose what I'm suggesting is on the positive side there's a very good way of defining the term prophecy . You define prophecy as suggesting the future and that is very much the kind of stage we're in now, both on the economic side and the ecological side as well. There is some extraordinarily good work going on already and actions being taken in both areas.

One thing to remember is that the world does not work entirely on a free market system : there are currently 950 million people who are members of cooperatives, mostly but by no means all in the Global South.

There are already alternative ways of one sort or another. There is extraordinary work being done at the moment by the New Economics Foundation in its Great Transition project is developing quite a complex but workable econometric model of the British economy which feeds in the need to go ultra low carbon and more equitable. I learned from one of them recently that in fact most econometric models don't actually factor in the way banks and finance houses behave in response to economic changes. They don't actually factor in behaviour of financial institutions and many other things they don't factor in, which is one of the reasons why these models take one particular route; but NEF (the New Economic Foundation) is looking at it differently.

You've got people like the guy who wrote "Prosperity Without Growth", Tim Jackson ; there's a lot going on in this field which is suggesting different ways forward; and of course within Britain we have this very interesting political development of the last few months where you now have two major parties one in Scotland, and one in the UK as a whole who are basically saying, " austeritey is a political choice". It makes, if nothing else, whatever you think of their views, it opens up the debate in a way we've not seen really for I would say twenty to thirty years. And so on the economic side, that's just a tiny bit of what's happening in Britain.

You look across the world, there is lots and lots of new thinking going on, if you like suggesting the possible. You look at the low-carbon side and here the developments are quite astonishing in terms of the even the technological sides. We are now moving into an era where just for a start people are now starting to talk about divestment from fossil carbon, that in fact this is economically a dangerous thing to have so much of your future potential actually locked up in something which is not actually burnable, because in fact if you began to burn even half of the remaining available fossil carbon, ( coal, gas and oil ),then the planetary system will be more or less entirely wrecked.

There are all kinds of new technologies which are coming forward or older technologies which are being improved , and one of the startling things is how quickly things can be taken up. One of the most remarkable examples of the last five years or so is the very rapid take-up of very simple quite small scale solar cells linked to batteries and light-emitting diode (LED) lights, so in other words a very simple device which in cost is about the same cost as a few months of kerosene for an old dirty lamp, will actually produce five or six hours of good light every evening if it's left out in the open during the day . Those are selling like wildfire right across

much of the Global South primarily so far in sub-saharan Africa. There are many many many other examples of what can be done given the political will and a number of countries are actually doing this.

One of our sons is actually a renewable energy engineer who works in the tropics. He works mainly in the West Indies and it's interesting how some of the West Indies islands who basically are entirely dependent on oil for all their electricity and just about everything else, are suddenly seriously waking up to the incredible solar and wind potential that they have, and this is repeated time after time.

We're not yet at the point worldwide where either the new kind of economic thinking, or the new developments on green technologies have become fully mainstream, we're not there yet, but it may be, and one says this reluctantly, that you will have to have the boost when you do get very major weather events; because one of the issues with climate change which is very clear is that one of the quite early effects is not that you get more frequent weather events, but the individual ones do become more severe.

That typhoon which hit the Philippines a couple of years ago, Haiyan I think it was called, when it hit landfall on one of the southern Philippine Islands the speed was astonishing. You know when we hear about the hurricane, the one we call a hurricane which hit South East England what twenty, thirty years ago, peaked at about 90 mph. That is not a level of a tropical storm. It did a huge amount of damage but basically because it caught people completely by surprise. But if you look at how hurricanes, cyclones and typhoons, they are all the same thing, are actually measured, they're measured by the average speed for a 10 minute period, and that particular typhoon had an average speed for 10 minutes of 160 miles an hour; about twice as fast as we have got in any major storm in Britain ever, except on top of the Cairngorms. That actually is an indicator of the sorts of issues we're going to have in the future.

Now in a sense you're almost getting very pessimistic. You say, "Well, you know, we could have huge disasters with huge numbers of people killed before people take notice", and this in a sense I think is the kind of race that we're facing; are we ready earlier to start making the really big changes or do we have to wait until there are such disasters that we're forced into action?

Whether it's the former or the latter depends crucially on the amount of work to show the positive things that could be done in the short term, to demonstrate what can be done and what could be done pretty easily. The fact that some forms of renewable power are now right down to grid parity with electricity produced by burning coal, getting very close to it in many parts of the world; so even economically it is starting to make much more sense quite apart from the utter environmental need.

But let me finish off by coming back to the overall theme. What we're talking about is security and future wars. In a nutshell I think what one has to recognize is the tendency to control new threats by means of, if need be, maintaining the status quo.

The term I use for this is "liddism": you keep the lid on things rather than going underneath to the actual underlying causes. And the thing is, it's not actually workable in the kind of world that we're facing. We have huge opportunities, but the risk is that we see things in the old way.

We're now into the 15th year of the war on terror, and the news this week is of an expansion of Taliban and indeed Isis activity in Afghanistan, that Isis has made further gains in Syria; that it has now decided to develop the capability to bring down airliners abroad; that it is taking root in other parts of the world and this is nearly fifteen years after we thought the way to handle it was by military means. And you talk seriously to recently retired military who are very open about the extent of the failure and the fact that it is not recognized and not understood and not appreciated more generally. People on the inside know how bad it's been, but essentially there's almost a kind of omerta, a wall of silence, about how badly it has gone wrong.

And that is an indication that "liddism", controlling things, not going underneath, is simply not working. We've really got to think things out. I think if there's one lesson to come out of the experience of the terrible events of 9/ 11 it is that the way that we chose to respond has not worked, and that's a very strong indicator that if we're really going to face the problems of a divided and constrained world, if we think we can maintain the status quo for maybe a fifth of the world's population, it will not work.

So I will conclude by saying we're in an extraordinary important era. I think the timescale really is between now and 2045 or more crucially between 2015 and maybe 2030. That is when you have to have very big changes taking place in how we think about security. If we do, then I think

we could look forward in the longer-term future to a world which becomes more peaceful.

If we don't, then I think we face a very difficult period. My wife and I have three grandchildren. One is aged 7, one is aged 4 and one is aged 1. All three of them could be alive in the 22nd century. They would be in their late eighties and early nineties. It would be lovely to think that, not when they're that old, but even when they're in their sixties, in the 2060s and 2070s, they could look back then from a world which is actually decidedly more peaceful and more stable and fairer; and it would be even nicer if they could look back and say, well that was due to the kind of thinking and actions that were taken by those people in the 2010s and 2020s. I think it's a heck of an aim to aim for, but we do have a very considerable responsibility to further generations to actually do it.

Thanks very much.